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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,976	07/17/2006	Takayuki Takahagi	127804	8155
25944 7590 11/05/2009 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER				
PARVINI, PEGAH				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
11/05/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/576,976

**Applicant(s)**

TAKAHAGI ET AL.

**Examiner**

PEGAH PARVINI

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,7,8 and 14-17 is/are pending in the application.
- 4a) Of the above claim(s) 7 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 14-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date 8/21/2009
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on August 21, 2009 has been entered.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1, 3, 14-17** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0081949 to Yoshida et al. in view of U.S. Patent No. 6,337,060 to Hiraki et al., and further, in view of "Safety data for pyridine" and/or MSDS for morpholine

It is to be noted that the MSDS and the Safety data sheet are only relied on for their disclosures of boiling points of pyridine and morpholine.

Regarding claims 1, 3 and 14-15, Yoshida et al. teach a polishing composition comprising a monoamine or a diamine such as pyridine, morpholine, etc. wherein said composition, further, comprises abrasives such as diamond particles having a size of, preferably, from 1-1000 nm, preferably 10 to 300 nm, and additionally, comprising water (Abstract; [0063], [0071], [0073]).

With reference to dispersant, it should be noted that as that shown by the instant application specification and instant claim 3, water may be used as the dispersant.

Even though Yoshida et al. disclose fine diamond particles (i.e. particle size of preferably, 10-300nm) do not disclose the treatment of diamond particles with a purifying agent. However, it would have been obvious to one of ordinary skill in the art to treat diamond particles with a purifying agent such as concentrated sulfuric acid as that taught by Hiraki et al. (column 3, lines 32-41; column 4, lines 66-68; column 5, lines 1-3 and 45-55) and heat the mixture motivated by the fact that this results in obtaining diamond particles which are not only functionalized and oxidized but also have lost at least less than one tenth of their impurities. The sulfuric acid causes metal impurities and graphite to be oxidized with  $\text{SO}_3$  to be dissolved as a sulfate and to form gaseous product (column 3, lines 49-54). In view of this, it is the examiner's position that using a pure diamond would preclude the inclusion of impurities in the polishing composition of Yoshida et al., thus, minimizing the contamination of the substrate it is used upon (i.e. surface grinding of a substrate as is apparent from the specification in section [0032]).

Even though the combination of Yoshida et al. in view of Hiraki et al. does not expressly disclose the boiling points of pyridine or morpholine, it is known that said

compounds have boiling points within the claimed range as evidenced by MSDS fact sheet of morpholine and the Safety data sheet for pyridine that their boiling points are within the range of 50°C-300°C (i.e. 128.19°C for morpholine and 115°C or pyridine).

Regarding claim 16, although the combination of references as applied above for claim 1 may not expressly disclose that the diamond particles have a purity of at least 95% or higher, said combination discloses a composition comprising water (i.e. dispersant), an amine compound such as pyridine and morpholine having a boiling point within the claimed range, and diamond fine particles which is made obvious to be purified and oxidized by concentrated sulfuric acid (i.e. purifying agent); therefore, the purity level of diamond particles is expected to follow from the purified and oxidized diamond particles of the combination of references absence clear and specific evidence showing the contrary.

Regarding claim 17, although the combination of references may not literally teach a size of 1-50 nm for the raw diamond particles, the combination of references and specifically, Hiraki et al. clearly disclose that an appreciable increase in suspension stability is obtained with fine particles having a size of less than 1 micron and a longer suspension holding time is obtained with fine particles of the size of 200nm or less (column 3, lines 1-13). Furthermore, Yoshida et al. clearly disclose diamond particles of the size of 1-1000 nm and preferably 10-300 nm. Therefore, one of ordinary skill in the art would have appreciated to have a fine particle size, such as what is claimed, for the

raw diamond particles, in the teaching of Yoshida et al. motivated by the fact that (1) the diamond particles of Yoshida et al. have 10-300 nm for diamond particles in use, thus, the raw diamond particles are expected to have sizes within this range, and (2) Hiraki et al. clearly make it obvious that particles of the size of less than 1 micron contribute an increase in suspension stability and the ones having a size of less than 200 nm contribute a longer suspension holding time.

With reference to overlapping ranges, it is to be noted that overlapping ranges have been held to establish *prima facie* obviousness. MPEP § 2144.05.

#### ***Response to Amendment***

Applicants' amendment to claim 15, filed on August 17, 2009, page 3, by removing triphenyl amine to overcome the objection made to the repetition of said amine substance is acknowledged. Therefore, the objection made to claim 15 as presented in the previous Office action is hereby withdrawn. However, said amendment does not place claim 15 or the application in condition for allowance.

Further amendments to claim 15, as presented in the amendment filed on August 17, 2009, page 3, is also acknowledged. However said amendments do not place claim 15 or the application in condition for allowance.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 3, and 14-17 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/  
Examiner, Art Unit 1793

/Anthony J Green/  
Primary Examiner, Art Unit 1793